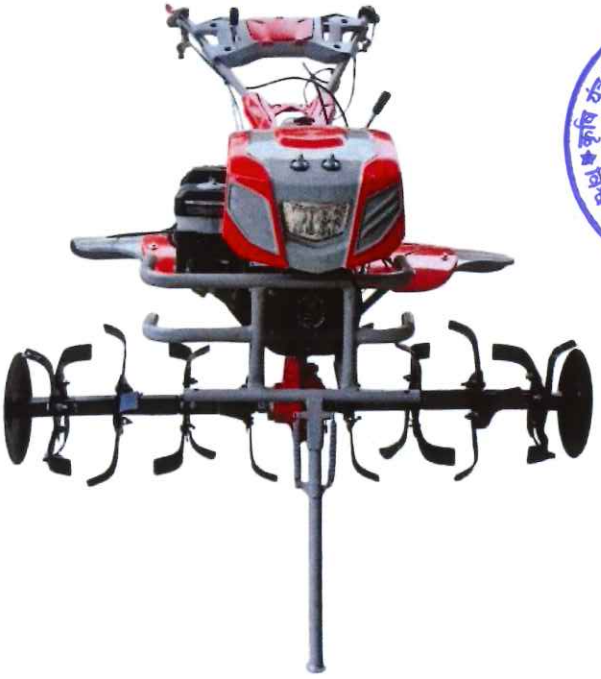
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT
(Initial)

संख्या/No.: ICE/NERFMTTI, B. Chariali/ 09/09/547
माह / Month: September 2025

THIS TEST REPORT IS VALID UPTO 30.09.2032



PSD, PSD-PWN, POWER WEEDER

सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA
कृषि एवं किसान कल्याण मंत्रालय
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
कृषि एवं किसान कल्याण विभाग
DEPARTMENT OF AGRICULTURE AND FARMERS WELFARE
उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान
NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE
बिश्वनाथ चारिआलि, जिला - बिश्वनाथ(असम)
BISWANATH CHARIALI, DIST- BISWANATH, ASSAM, PIN - 784 176
[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Ph. No. 03715-222094 **Website: https://nerfmtti.nic.in** **E-mail: fmti-ner@nic.in**

4. SPECIFICATIONS

4.1 General:

Make	:	PSD
Model	:	PSD-PWN
Name and address of the manufacturer	:	M/s. SICHUAN SUITONG SCIENCE AND TECHNOLOGY CO., LTD., NO. 15 SICHUAN-CHONGQING OOPERATION DEMONSTRATION PARK, GAOTAN, LINSHUI COUNTY, SICHUAN PROVINCE, CHINA
Name and address of applicant	:	PSD INDUSTRIES PVT. LTD., NUR SARAI, CHANDASHI, A.D.N. KUTIR, NUR SARAI, NALANDA, BIHAR, 803113
Name of machine	:	Power weeder
Type of machine	:	Self propelled, Walk behind
Working size of machine (mm)	:	1170
Year of manufacture	:	2023
Serial no. of machine	:	2411163211

4.2 Details of prime mover:

Make (apa)	:	SICHUAN
Model	:	170F
Type	:	Four stroke, single cylinder, air cooled, spark ignition engine
Year of manufacture	:	2023
Serial number	:	24111024561
Country of origin	:	CHINA
Recommended high idle speed (rpm)	:	3800 ± 100
Recommended low idle speed (rpm)	:	1400 ± 100
Recommended rated speed (rpm)	:	3600
Rated power observed (kW)	:	**3.30**
Rated power declared (apa) (kW)	:	4.50

11.2 Chemical composition of rotor blades:

Constituents	As per IS 6690:1981 (Reaffirmed 2022)		Composition as observed (% by weight)	Remarks
	Carbon Steel (%)	Silicon Manganese Steel (%)		
Carbon (C)	0.70 -0.85	0.50-0.60	0.235	**Does not conform**
Silicon (Si)	0.10 -0.40	1.50-2.00	0.325	Conforms
Manganese (Mn)	0.50 -1.0	0.50-1.00	1.276	**Does not conform**
Sulphur (S)	0.05(max)	0.05(max)	0.024	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.024	Conforms

12. FIELD PERFORMANCE TEST

The field tests were conducted for total 25.74 hours of field operation for testing the said Power Weeder. The field tests were conducted at rated speed of 3600 rpm. The detailed test results are represented in the Annexure and summarized in the ensuing Table:

Sr. No.	Parameters		Observations
1	Type of soil	:	Medium
2	Soil moisture (%)	:	8.92 to 9.90
3	Bulk density of soil (g/cc)	:	1.62 to 1.93
4	Forward speed of operation (kmph)	:	0.95 to 1.21
5	Depth of cut (cm)	:	4.8 to 5.8
6	Width of cut (m)	:	1.14 to 1.18
7	Area covered (ha/h)	:	0.092 to 0.109
8	Time required for one ha (h)	:	9.17 to 10.87
9	Field efficiency (%)	:	79.6 to 88.4
10	Weeding efficiency (%)	:	76.2 to 82.1
11	Fuel consumption		
	l/h	:	1.10 to 1.20
	l/ha	:	11.00 to 12.50

12.1 Rate of work

- Rate of work was recorded as 0.092 to 0.109 ha/h and the forward speed of operation varied from 0.95 to 1.21 kmph.
- Time required to cover one hectare was recorded as 9.17 to 10.87 h.

12.2 Quality of work:

- Depth of cut was recorded as 4.8 to 5.8 cm.
- Working width was observed as 1.14 to 1.18 m.
- Field efficiency was found as 79.6 to 88.4 %.
- Weeding efficiency was recorded as 76.2 to 82.1 %.

12.3 Adequacy of power of prime mover:

The power of prime mover was found adequate.

12.4 Wear Analysis of rotor blades:

Sr. No	Initial mass(g)	Final mass (g)	Loss of mass (g)	Percentage wear of rotor blades	
				After 25.58h	Per hour
R-1	298.26	294.31	3.95	1.32	0.05
R-2	281.72	278.62	3.1	1.10	0.04
R-3	308.45	304.97	3.48	1.13	0.04
R-4	288.18	284.07	4.11	1.43	0.06
L-1	293.82	289.26	4.56	1.55	0.06
L-2	313.95	310.43	3.52	1.12	0.04
L-3	296.33	292.90	3.43	1.16	0.04
L-4	309.95	307.10	2.85	0.92	0.04

The hourly rate of wear of blade on mass basis after field operations was recorded as 0.04 to 0.06 %.

13. EASE OF OPERATION AND ADJUSTMENTS

Machine maneuverability while taking turns during field operation was not comfortable.

14. DEFECTS, BREAKDOWNS AND REPAIRS

No defect or breakdown was observed during test.

15. COMPONENTS / ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

15.1 Engine:

The Engine and other assemblies were dismantled after 39.99 hours of operation.

15.1.1 Cylinder:

Cylinder	Cylinder bore dia (mm)						Max. Permissible wear limit (mm)
	Top position		Middle positon		Bottom position		
	Thrust side	Non Thrust side	Thrust side	Non Thrust side	Thrust side	Non Thrust side	
1	70.01	70.00	70.01	70.00	70.01	70.00	70.30

15.1.2 Piston:

Piston dia., mm				Max. Permissible wear limit at skirt (mm)	Clearance between piston & cylinder liner at the skirt of the piston (mm)	
Top (above top compression ring)		At skirt				
Thrust side	Non-thrust side	Thrust side	Non-thrust side		As observed	Max. permissible limit (mm)
69.51	69.51	69.95	*	69.30	0.06	0.10

*Not recorded due to piston design constraints.

15.1.3 Ring side clearance:

Piston Rings	Ring Side clearance (mm)	Max. Permissible wear limit (mm)
1st Compression ring	0.04	0.30
2nd compression ring	0.03	
Oil ring	*	0.15

*Not recorded due to ring design constraints

15.1.4 Ring end gap clearance:

Ring No.	Ring End gap (mm)			Max. Permissible wear limit (mm)
	At top	At middle	At bottom	
1st Compression ring	0.20	0.20	0.20	1.00
2nd compression ring	0.25	0.25	0.25	1.50
Oil ring	NA	NA	NA	1.20

15.1.5 Big end bearing:

Bearing no.	Dia of bearing (mm)	Dia of Crank pin (mm)	Clearance (mm)		Max. Permissible wear limit (mm)	
			Diametrical	Axial	Diametrical	Axial
1	30.08	29.98	0.10	NA	0.25	0.80

15.1.6 Main bearing: Two Nos. of ball bearings 6205 were used.

Bearing No.	Diametrical clearance (mm)	Crankshaft end float (mm)	Max. permissible clearance limit(mm)	
			Diametrical clearance	Crankshaft end float
1.	Ball bearing	0.03	NA	0.30
2.	Ball bearing			

15.1.7 Valve guide clearance:

Valve guide diameter (mm)		Valve stem diameter (mm)		Valve guide clearance (mm)		Max. Permissible wear limit (mm)	
Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust
5.50	5.50	5.46	5.45	0.04	0.05	0.15	0.20

Valve, guide and timing gear:-

Any marked sign of overheating of valves : None

Pitting of seat/faces of valves : None

Any visual damage of teeth of timing gears : None

Condition of ignition coil & magneto : Normal

15.2 Clutch: No noticeable defects observed.

15.3 Transmission gears: No noticeable defects observed.

15.4 Rotary drive unit: The rotary drive unit was dismantled and all the components were found in normal condition.

16. CRITICAL TECHNICAL SPECIFICATIONS
(Vide Ministry's letter No. 13-9/2019-(M&T) (I&P)-Part dated 26.04.2019)

Sr. No.	Parameters	Specifications	Observation	Remarks
1	2	3	4	5
1.	Type	Self-propelled, walk behind	Self-propelled, walk behind	Conforms
2.	Working width (mm)	300 –1500	1170	Conforms
3.	Type of engine	Compression ignition / Spark ignition	Spark ignition	Conforms
4.	Starting method	Manual / recoil /self-starting	Recoil starting	Conforms
5.	Type of clutch	Dry / Wet	Wet	Conforms
6.	Type of primary gear box	Sliding / constant mesh or combination of both	Sliding mesh	Conforms
7.	Type of secondary gear box	Gear type	Gear type	Conforms
8.	Material for rotor shaft	SAE1045 (CRS) / EN8 / EN9	Mild steel (apa)	**Does not conform**
9.	No. of flanges	4 - 10	8	Conforms

1	2	3	4	5
10.	Type of flanges	Square / circular/ rectangular	Square	Conforms
11.	Distance between consecutive flanges (mm)	80 to150	110 to 140	Conforms
12.	No. of blades in each flange	3 - 6	4	Conforms
13.	No .of rotor blade	12 (Min.)	32	Conforms
14.	Thickness of rotor blade (mm)	5 (min.)	5.04	Conforms
15.	Material of blade	Boron (28Mn Cr B5) / High Carbon Steel EN42j	65 Mn (apa)	**Does not conform**
16.	Hardness of Blade, HRC	38 (Min.)	46.5	Conforms
17.	Shape of rotor blade	C / J shape	J shape	Conforms
18.	Provision for handle height adjustment	Must be provided	Provided	Conforms
19.	Provision for handle rotation	Must be provided	Not Provided	**Does not conform**
20.	Provision for emergency stop of engine	Must be provided	Provided	Conforms
21.	Provision for easy start of engine	Must be provided	Provided	Conforms
22.	Provision for shield/cover to prevent flying of mud & stone from rotor	Must be provided	Provided	Conforms
23.	Depth control mechanism	Must be provided	Provided	Conforms
24.	Provision for transport wheels	Must be provided	Provided	Conforms
25.	Provision for cover on exhaust	Must be provided	Provided	Conforms
26.	Direction of exhaust emission away from operator	Must be provided	Provided	Conforms
27.	Marking / labeling of machine	The labeling plate should be riveted on the body of machine having Name and address of manufacturer & Applicant, Country of origin, Make, Model, Year of manufacturer, Serial number, Engine number, Engine HP, rated rpm & SFC.	Name and address of manufacturer & Applicant, country of origin, Year of manufacture, Engine number, Engine HP and SFC were not provided.	**Does not conform**

1	2	3	4	5
28.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms

17. COMMENTS AND RECOMMENDATIONS

17.1 The average rated power in rating test of engine was observed as 3.30 kW against declared value of 4.50 kW by the applicant/manufacturer. This should be looked into for corrective action.

17.2 The specific fuel consumption (SFC) in rating test of engine was observed as 376 g/kWh against declared value of 350 g/kWh by the applicant/manufacturer which exceeded by more than 5 percent of that declared by the manufacturer and hence does not fulfill the requirement of IS 7347-1974 (Amended 2021). This should be looked into for corrective action.

17.3 Name and address of manufacturer and applicant, country of origin, year of manufacture, Engine number, Engine HP and SFC were not provided on the labeling plate. This should be looked into for corrective action.

17.4 The engine was not marked with manufacturer name or trade-mark which does not fulfill the requirement of IS 7347-1974 (Amended 2021). This may be looked into.

17.5 The hardness and chemical composition of rotary blades does not conform to the requirement of IS 6690:1981 (Reaffirmed 2022). This may be looked into for corrective action.

17.6 Noise at operator's ear level was observed on higher side against warning limit of 85 dB(A) as specified by the International Labour Organization (ILO) for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operator's comfort and safety.

17.7 The amplitude of mechanical vibration marked as (*) is on drastically higher side and is directly concerned with operator's health, safety and comfort. Besides, it is also adversely affect the useful life of machine components. In view of above, this deserves to be given top priority for corrective action.

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17.8 Adequacy of Literature:

The following literature in English language was provided for reference during testing:

- Operator's/ Service manual
- Parts catalogue

It is recommended to bring out the manual in Hindi and other vernacular languages as per IS: 8132-2023.

TESTING AUTHORITY

(M.R. PATIL)
SENIOR AGRICULTURAL ENGINEER

(P.KAMALABAI)
DIRECTOR

Draft test report compiled by **Sh. D Deori, Technical Assistant**

18. APPLICANT'S COMMENTS

We have received your comments and recommendation we will do the corrective action in future products.

ANNEXURE

FIELD PERFORMANCE RESULTS

Place of Test: NERFMTTI Farm, Biswanath Chariali, Biswanath, Assam

Sr. No.	Parameters	I	II	III	IV
1	Date of test	27.8.2025	01.9.2025	02.9.2025	03.9.2025
2	Net test duration (h)	7.00	4.16	7.50	7.08
3	Field length (m)	40.0	35.0	33.0	33.0
4	Type of soil	Medium			
5	Bulk density (g/cc)	1.62	1.83	1.82	1.93
6	Soil moisture (%)	9.9	9.8	9.8	8.9
7	Previous treatment	Nil			
8	Forward speed (kmph)	1.21	1.11	0.96	0.95
9	Av. depth of cut (cm)	4.8	5.2	5.4	5.8
10	Av. width of cut (m)	1.14	1.16	1.14	1.18
11	Area covered (ha/h)	0.109	0.105	0.092	0.099
12	Time required for one ha (h)	9.17	9.52	10.87	10.10
13	Field efficiency (%)	79.6	81.4	83.6	88.4
14	Av. height of weeds (cm)	11.7	21.0	19.4	20.6
15	Av. number of weeds per m^2 (before operation)	190	160	186	154
16	Av. number of weeds per m^2 (after operation)	34	31	34	37
17	Weeding efficiency (%)	82.1	80.5	81.6	76.2
18	Fuel Consumption				
	l/h	1.20	1.18	1.15	1.10
	l/ha	11.00	11.23	12.50	11.11